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Lomachashaka gomaya, a new sporodochial hyphomycete from India

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Abstract — *Lomachashaka gomaya,* a new sporodochial hyphomycete isolated from cattle dung collected from the forests of Western Ghats, Karnataka State, India, is described and illustrated. It is accommodated in the genus because of its hyaline setae with bulbous base and conidia with cupulate, mucoid apical appendages. It differs from other species in the genus by its longer setae, verrucose conidiophores and smaller conidia with the dimensions 6.5–8.5 × 2.5–3.5µm.

Key words — anamorphic fungus, biodiversity

Introduction

During a survey of microfungi of the forests of Western Ghats in southern India, a novel sporodochial fungus was isolated from cattle dung collected at Yana, a tiny hamlet amidst dense and pristine tropical forests, 30 km from Kumta, Uttara Kannada District, Karnataka State, India (latitude 14° 26' N, longitude 74° 27' E).

Materials and methods

Partially decomposed, air-dried cattle dung was taken to the laboratory in paper bags. A small lump of the dung was rehydrated using sterile distilled water and incubated in a sterile moist chamber. After 8 days of incubation, fungal fruit bodies appeared on the dung. The fungus was studied under stereo- and binocular microscopes. A pure culture was established by streaking a sterile needle tip-full of conidia on 2% malt extract agar (HiMedia, India) containing antibiotics (bacitracin 0.02 g, neomycin 0.02 g, penicillin 0.02 g, streptomycin 0.02 g and tetracycline 0.04 g dissolved in 10 ml of sterile distilled water, added to 1 L medium). Germinated individual conidia were transferred onto malt extract agar slants for culture maintenance.

Taxonomic description

Lomachashaka gomaya S.K.Yadav & Bhat, sp. nov. FIGURES 1–7

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Coloniae lente crescentes in agaro extracto malti, albae, mycelium floccosum, hyalinum lanatum, 4mm diam. post 20 dies 22–24°C. Sporodochia superficialia, dispersa vel 2–3 aggregata, viridia vel viridulo-atra, 200–235 µm alta, 150–160 µm diametro Setae numerosae hyalinae, laeves, crassitunicatae, verrucosae ad basim, sursum obtusae vel rotundatae, septatae, cellulis lumine reducto, non ramosae, 110–190 µm longae, 6–6.3 µm latae Conidiophora aggregata, integrata, subhyalina, verrucosa, septata, ramosa, 75–95 × 2.0–8.5 µm. Cellulae conidiogenae monophialidicae, verrucosae, subhyalinae, 8–14.5 × 2 µm, collare conspicuum formantes. Conidia fusiformi-ellipsoidea, sursum acuta, unicellularia, subhyalina, laevia, 6.5–8.5 × 2.5–3.5 µm, appendice funiculari, cupulari, mucido, hyaline, 2–3 µm lato praedita.

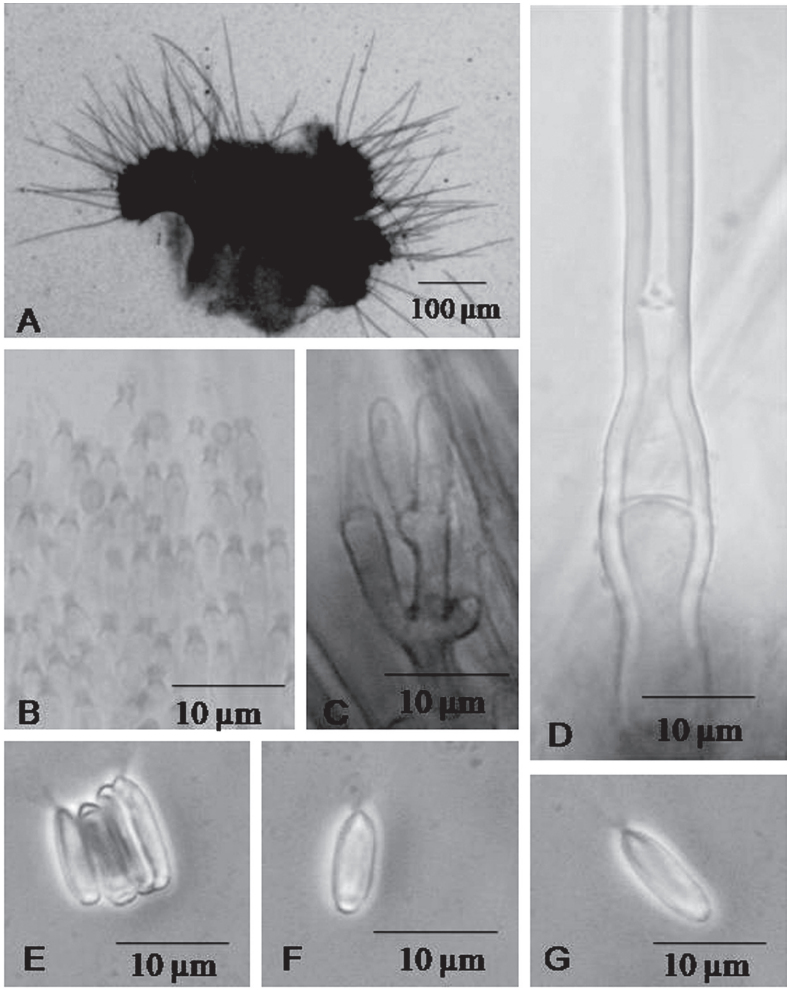
HOLOTYPE: On cow dung, Yana, Uttara Kannada District, Karnataka State, India. 27.07.2008 col. Ashish Prabhugaonkar Herb. No. HCIO 49196

ETYMOLOGY: *gomaya* (Sanskrit), referring to the substrate, cattle dung.

Colonies slow growing, attaining a diam. of 4mm in 20 d in 2% malt extract agar (HiMedia, India), mycelium white, floccose, becoming cottony after 12 days in diurnal light at 22–24°C. As on the natural substrate, sporodochia in culture are superficial, scattered or in groups of 2–3, dark green to greenish black, 200–235 diam. × 150–160 µm high. Setae numerous, unbranched, hyaline, smooth, thick-walled, verrucose at the swollen base, blunt to rounded at the tip, septate, cells with reduced lumen, 110–190 µm long, 6–6.5 µm wide. Conidiophores integrated, subhyaline, verrucose, septate, penicillately branched, 75–95 × 2.0–8.5 µm. Conidiogenous cells integrated, monophialidic, verruculose, subhyaline, 8–14.5 × 2 µm, with conspicuous collarette and moderate periclinal thickening at the tip. Conidia fusiform-ellipsoidal with an acute apex, unicellular, subhyaline (in mass olivaceous-green), smooth, 6.5–8.5 × 2.5–3.5 µm, with a funnel-shaped, cupulate, mucoid, hyaline, 2–3 µm wide appendage.

Discussion

The genus *Lomachashaka* Subram., typified by *L. kera* (Subramanian 1956), is characterized by sporodochial, setose conidiomata, smooth or verrucose conidiophores, phialidic conidiogenesis and fusiform-ellipsoidal conidia with an apical, cupulate, mucoid appendage. Our new species *L. gomaya* is compared with the four hitherto known species in the genus (TABLE 1). The new species is characterized by long setae with a verrucose bulbous base, verrucose conidiophores, and small conidia. The conidial size of the novel species overlaps with that *L. africana*, but the species are distinctly different in their others characters. The coprophilous habit of *L. gomaya* also distinguishes it from the plant substrates, especially monocots, colonized by the other species.



Figures 1–7. *Lomachashaka gomaya.*
A. Conidiomata. B. Conidiogenous cells. C. Conidiophores. D. Seta. E–F. Conidia.

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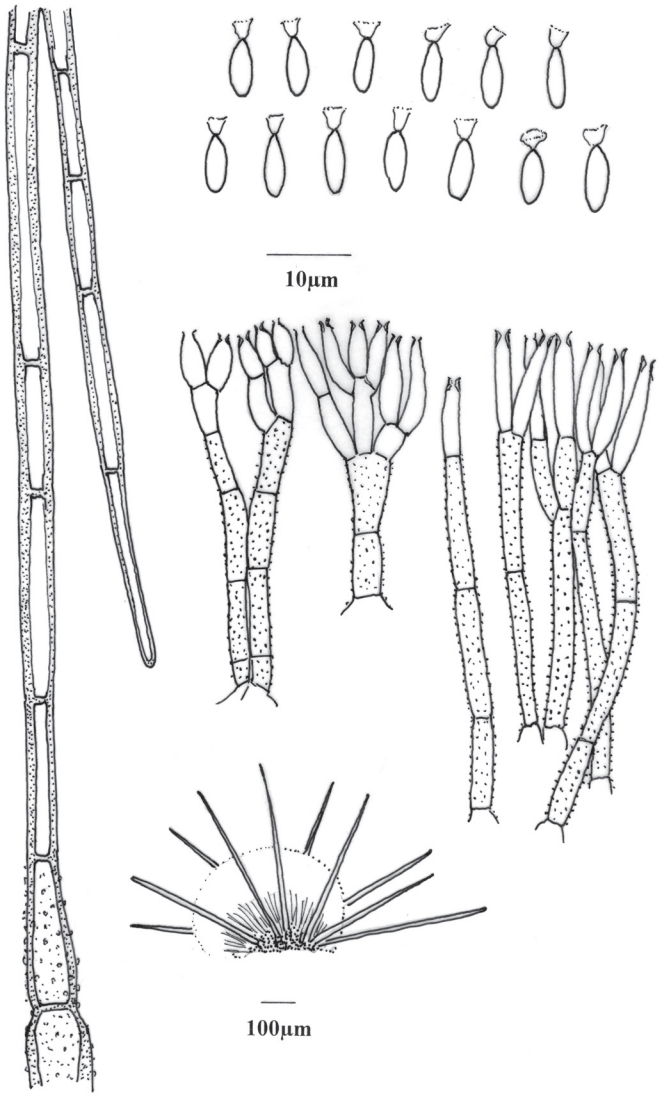

Figure 8. *Lomachashaka gomaya.*
Seta, Conidia, Conidiophores and conidiogenous cells, Conidioma.

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Table 1: Comparison of *Lomachashaka gomaya* with four known species

Characters Species / (reference)	Substrate (Locality)	Conidiomata	Setae	Conidiophores [all branched]	Conidiogenous cells	Conidia [apices funnel-shaped & mucoid]
L. africana Nag Raj (Nag Raj 1995)	Leaves of *Pennisetum purpureum* (Togoland)	Applanate to discoid; 140–200 × 30–40 µm	Filiform, flexuous; base bulbous, thick-walled, smooth; apex 70–160 µm long	Compact, smooth, hyaline to pale olivaceous	Subcylindrical to lageniform, flared collarette & mod. periclinal thickenings, pale olivaceous, 7–11 × 2–3 µm, twice percurrently proliferating, smooth	Fusiform, 6–9.5 × 2–2.5 µm
L. cynodontis Nag Raj (Nag Raj 1995)	Leaves of *Cynodon dactylon* (Ghana)	Aplanate to discoid; orbicular to oval, 160–220 × 40–80 µm	Base ampulliform to conical, smooth, 7–12 × 3.5–4.5 µm, separate from irreg. nodulose part; apex thick-walled, smooth, 50–140 µm long	Compact, smooth, hyaline to pale olivaceous	Vase-shaped with walls invaginated near median, with flared collarette & mod. periclinal thickenings, percurrently proliferating 1–2 times, smooth	Fusiform, pale olivaceous, smooth, 7–12.5 × 0.5–3.5 µm
L. gomaya (Present study)	Cattle dung (India)	Cupulate; 200–235 × 150–160 µm	Erect, unbranched, hyaline, smooth, with swollen, verrucose base, blunt at the tip, septate, 110–190 × 6–6.5 µm	Compact, verrucose, septate, sub hyaline to olivaceous	Mostly smooth, occ. minutely verrucose, subhyaline, phialidic, conspicuous collarette & mod. periclinal thickenings at the tip, 8–14.5 × 2 µm	Fusiform, smooth, hyaline, unicellular, olivaceous, 6.5–8.5 × 2.5–3.5 µm
L. kera Subram. (Subramanian 1956)	Dead leaves of *Cocos nucifera* (India)	Cupulate; 210–350 × 80–100 µm	Erect, thin-walled, hyaline, erect or flexuous, ≤ 200 × 1.5–2.5 µm	Compact, smooth, hyaline	Subcylindrical to lageniform, colourless, 13–19 × ≤ 3 µm	Fusiform, colourless, 9–14 × 2–4 µm
L. sundara Nag Raj (Nag Raj 1995)	Grass blades (India)	Pulvinate to discoid, cupulate, orbic. to oval; 100–180 × 60–100 µm	Base septate, verruculose, swollen, 15–20 × 2.5–3.5 µm; apex slender, thick-walled, irreg. nodulose, smooth, 120–300 µm	Smooth, hyaline	Subcylindrical to lageniform with flared collarette & marked periclinal thickenings, pale olivaceous, smooth, 9–15 × 2.5–3 µm	Fusiform or fus.-elliptic, pale olivaceous, smooth, 7–12.5 × 2.5–3.5 µm